LIBRARY
RECEIVED
★ MAR 2 1940 ★
U. S. Department of Agriculture

THE PLANT DISEASE REPORTER

Issued By

Division of Mycology and Disease Survey

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

Volume XXIV Number 3

February 15, 1940

The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

THE PLANT DISEASE REPORTER

Issued by

THE PLANT DISEASE SURVEY

DIVISION OF MYCOLOGY AND DISEASE SURVEY

Volume XXIV Number 3

February 15, 1940

IN THIS ISSUE

Glenn G. Hahn gives a brief account of the history, distribution, and hosts of the cedar-blight fungus, page 52. In another note he reports its occurrence in 1939, page 57.

Economic considerations are a chief factor in determining control procedure for the gardenia blight, according to Malcolm A. McKenzie, Linus H. Jones, and Constantine J. Gilgut, page 58.

J. A. Milbrath reports the occurrence of verticillium wilt on laurestinus in Oregon, page 62.

The occurrence of Granville wilt on tobacco in Maryland is reported by E. A. Walker, page 63.

Results from peanut leafspot control experiments in Virginia in 1939 are reported by Lawrence I. Miller, page 63.

John T. Middleton sent the note on nematode injury to potatoes in California, page 64, in response to the request for such information in the December 15 issue of the Reporter.

Lawns of St. Augustine grass in the Gulf Coast section of Texas are affected by brown patch, according to A. A. Dunlap and Walter N. Ezekiel, page 65.

January cold weather caused heavy damage to crops in southern regions, according to the Weather Bureau, page 66. What effect there will be on the development of plant diseases remains to be seen.

DISTRIBUTION AND HOSTS OF CEDAR BLIGHT IN THE UNITED STATES

Glenn Gardner Hahn

Cedar blight (Phomopsis juniperovora Hahn) (5,8) continues to be a notifiable disease of economic importance in the propagation of red cedars (Juniperus virginiana) and its horticultural varieties (2,4). At a nursery in Kent, Iowa, the blight was reported for the first time by Stewart (10) as being very destructive late in the 19th century (1895 to 1897).

During the 2 decades (1897 to 1917) that followed reports of the nursery disease accumulated. By the end of this period, red cedar blight, as it was called at the time, was known not only to be distributed (Fig. 1) on nursery stock throughout Iowa (Shenandoah, Kent, Charles City, Osage), but also to occur similarly in the following adjoining Central States: Minnesota (Albert Lea, near the Iowa State boundary); Nebraska (North Bend, Cedar Bluffs, Beatrice, Fairbury, in the southeastern part of the State); and Missouri (St. Joseph, in the northwestern part of the State). It also occurred in nurseries in the northern and northeastern part of the near-by State of Kansas (Hays, Wells, Manhattan). According to a written communication from C. A. Scott, cedar blight invaded the State Experiment Station nursery at Manhattan for the first time in 1915, destroying the entire crop of seedlings. One large nursery in northeastern Illinois that had specialized in growing red cedar for a number of years informed the writer that the disease was first encountered and caused considerable damage in its seed beds that same year. About this time cedar blight also was known in other nurseries in Illinois (Harvard, Glenview) in the same general region. In the infection area just described, the disease had become so devastating that growers not only experienced heavy losses of stock, but also in some cases were compelled to discontinue propagating red cedar because of the ravages of the disease (1, p. 2; 9, p. 19).

In 1917 when the first account of cedar blight and its causal organism was published (8), Pennsylvania was the only State outside of the Central States known to the writers in which the disease occurred (Fig. 1). In two instances Phomopsis juniperovora was identified (1916) on diseased nursery stock introduced into Pennsylvania (Chestnut Hill, near Philadelphia; Morrisville) from the central region of the United States.

Since the publication of this paper (8), Phomopsis juniperovora is known at the present time to be widely distributed (2,3,7) on planted nursery and ornamental stock in the eastern section of the United States (for geographical sections see Rand-McNally Commercial Atlas, Ed. 62). It is also present in 4 near-by States of the western section of the country (Fig. 1).

In the eastern section of the United States (Fig. 1), in addition to the 4 Central States (Minnesota, Iowa, Missouri, Illinois) in which cedar blight was destructive at an early period (8, 9, 10) the disease is known to occur in the following States: Michigan, Wisconsin, Ohio, Indiana, Kentucky,

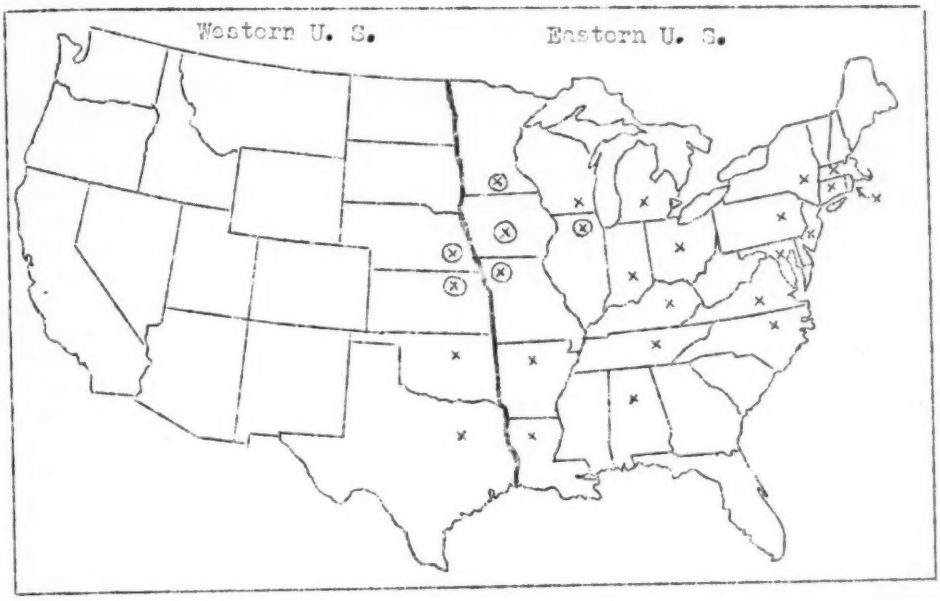

Fig. 1. Distribution of cedar blight (Phomopsis juniperovora) by States through 1939. (Map prepared by G. G. Hahn).

Legend:

⊗ Central States in which cedar blight first was known to be destructive in nurseries, 1895 to 1917.

× States in which cedar blight was reported later on nursery and ornamental planted cedar stock. In Pennsylvania (see text) the disease was observed on introduced nursery stock as early as 1916.

- - - - - - - - -

Tennessee, Arkansas, Louisiana, Alabama, North Carolina, Virginia, Maryland, Pennsylvania, New Jersey, New York, Connecticut, Rhode Island, and Massachusetts. The disease is known too in the District of Columbia, where it was identified on planted ornamental junipers. It is of interest to report that about the time of its discovery in the District (1920), a preliminary investigation was made of blight on wildling junipers growing there. The writer, however, was unable to find Phomopsis juniperovora on native stock he examined growing about the District.

In the western section of the United States (Fig. 1), cedar blight has been reported up to the present time from Nebraska, Kansas, Oklahoma, and Texas. As stated above, the disease was reported destructive in Nebraska and Kansas at an early period (8,9). Since that time Oklahoma and Texas have been added recently to the roster of States in this section.

It will be noted in Figure 1 that Phomopsis juniperovora is not recorded in the States of the Northwest and Southwest. Collections of Phomopsis on junipers taken in these western regions have been examined by the writer and found to be the closely related Phomopsis occulta Trav. (7). The report of P. juniperovora in California (7) made previously by the writer is open to question. This record needs confirmation based on an intensive culture study to establish beyond question the identity of the Phomopsis collected there. Moreover, in the western section (Fig. 1) it will be noted likewise that cedar blight is not listed from the Dakotas. Furthermore, in the eastern section (Fig. 1) so far as known, reports of the disease have not been made from northern New England (Vermont, New Hampshire, Maine). For certain southern States, namely, Mississippi, Florida, Georgia, and South Carolina, cedar blight has not been reported in a considerable literature examined by the writer. Although Florida had been recorded previously (7), this report was based on information concerning badly diseased nursery stock brought into Florida, which may have been destroyed before planting.

The problem concerned with the origin of Phomopsis juniperovora in this country and its gradual appearance over a wide territory is an exceedingly interesting one. We have for many years assumed that the organism occurred on wildling junipers but our ideas regarding the actual colonization of this type of stock by the parasite were based on slender evidence. Recently Davis and Latham (3) made a number of microscopic observations corroborated by culture studies of Phomopsis on native junipers, and have identified the parasite, P. juniperovora, fruiting on dead shoots and cankers of wildling red cedar seedlings and older trees growing in natural stands in Virginia, North Carolina, and Tennessee. However, this is not the only way in which cedar blight was distributed, for we have evidence that the disease in the eastern section of the United States (Fig. 1) was transported from one State to another within a given region on infected nursery stock. Moreover, we also have evidence that it was transported from one region to another in a like manner from the Central and Southern States to States along the Atlantic Seaboard.

The range of Phomopsis juniperovora has been extended since the writer's report on the distribution by States of the parasite in 1929 (7) to include Michigan. In 1930 a small amount of blight was reported in a nursery near Pontiac. Other investigators have reported the organism in the following States not published in the roster of 1929 (7): Massachusetts (1932) (PDR Suppl. 85: 65. 1933); Texas (1935) (PDR Suppl. 96: 244, 247. Dec. 31, 1936); Virginia (1937) (2); Indiana (1937) (2); Oklahoma (1937) (PDR Suppl. 110: 245. Dec. 31, 1938); and Arkansas (1938). Although Indiana, Arkansas, Oklahoma, and Texas are located close to the Central States in which cedar

blight was very destructive at an early period, the parasite has been reported comparatively recently from these four near-by States. In July 1938, D. H. Latham at one nursery in Arkansas (Russellville) observed 10 percent of the red cedar seedlings so badly affected that they were removed from the beds as a part of a sanitation program. The blight was destructive in this nursery among wildling transplant stock about 2 to 4 feet high that had been dug up at various places in the near-by forest. This unpublished report communicated by Latham is, so far as known, the first for Arkansas. In the Oklahoma report listed above, P. juniperovora is cited as follows: "one report, fungus new to State." Although, so far as known, the first published record of cedar blight in Virginia was made in 1937 (2), the writer has an unpublished earlier record of it in that State. In 1932, specimens submitted by R. M. Maddox, Virginia State Forest Service, were examined by the writer and found to be attacked by P. juniperovora.

Phomopsis juniperovora as a parasite of nursery and ornamental stock attacks red cedar and some of its varieties most severely. It also causes material damage to other species and varieties among the Cupressaceae (7). Artificial infections of the cedar blight organism on Douglas fir (Pseudotsuga taxifolia) and European larch (Larix europaea) have been reported (6), but the fungus has not been found to date in nature on these conifers. Another Phomopsis species, P. occulta (7), which for the most part is generally saprophytic on Cupressaceae and other conifers throughout the United States, does occur on Douglas fir, larch, hemlock, yew, etc. This species may be confused with the true cedar-blight parasite, for the 2 species morphologically resemble each other closely. There are, however, slight differences that distinguish them. They are most easily distinguished physiologically by culture characters. P. juniperovora produces a characteristic yellow pigmentation which becomes dull orange-red with age and this is accompanied by the formation of flaming orange crystals (5). P. occulta, occurring on a considerable number of conifers, does not produce the yellow color or crystals. According to our present knowledge of the parasite, P. juniperovora is restricted to trees and shrubs belonging to the cypress tribe..

The extensive host list for Phomopsis juniperovora, based largely upon the observations made by the writer (4,7), together with those of other investigators (2,4,11) is extended to include Juniperus japonica, J. chinensis var. mas, J. horizontalis var. douglasii, and J. ashei. In 1932, Japanese juniper (J. japonica) was reported attacked in Massachusetts (PDR Suppl. 85: 65. 1933). The same year diseased material of Waukegan juniper (J. horizontalis var. douglasii) growing in Maryland was examined by the writer and found infected with the cedar-blight organism. Two years later (1934) badly diseased material from a nursery in Rhode Island was submitted under the name J. columnaris. Through the kindness of Mr. Alfred Rehder, the host was identified as the variety mas of the Chinese juniper, J. chinensis. This material was examined by the writer and found infected with P. juniperovora. The variety was reported in 1938 (4).

The number of recorded juniper species and varieties resistant to cedar blight is exceedingly limited. In 1928, White (11) reported the spiny Crock juniper, Juniperus excelsa var. stricta, used commonly for grafting purposes, and Juniperus virginiana var. ketoleeri as being highly resistant to Phomopsis juniperovora. The list of cedar-blight-resistant junipers is now extended to include a variety of red cedar, J. virginiana var. pyramidiformis hillii, the "Dundee" or "Hill Dundee" juniper, (L. H. Bailey, Cultivated Evergreens, p. 205, 1929) reported to be highly resistant to cedar blight (4). In a written communication from D. H. Latham (January 27, 1940) the writer is informed that this particular blight-resistant variety was propagated from a single tree that was discovered under field conditions to be highly resistant to Phomopsis juniperovora. The cedar-blight-resistant juniper may also show resistance to Gymnosporangium juniperi-virginianae. The "Dundee" juniper growing in the Arnold Arboretum was not observed as susceptible to the cedar-apple rust by I. M. Crowell (Journ. Arnold Arboretum 15: 174-175. 1934). However, it was reported infected with the rust in Iowa by D. M. Bliss (Iowa State College Agr. and Mech. Arts Res. Bul. 166: 340-392. 1933).

Negligible cedar-blight infection was reported on Juniperus ashei in Kentucky and Missouri in 1937 by Davis and Latham (2). This new host for Phomopsis juniperovora is commonly called the Ozark or Arkansas white cedar and was described by J. T. Buchholz (Bot. Gaz. 90: 326-332. 1930) as a one-seeded juniper species closely related to J. monosperma and morphologically distinct from J. virginiana. The wood of J. ashei, which produces a shrub-like tree 12 to 20 feet high with a trunk usually forked at or near the base, is highly prized for posts because of its durability. Interest in the species has been shown because of its alleged resistance to cedar-apple rust. As stated above, however, J. ashei has shown a slight degree of susceptibility to cedar blight (2). In a government nursery at Elsberry, Missouri (2), Latham informed the writer (communication, Jan. 27, 1940) that stock of the Ozark white cedar was affected again in 1938 although the disease was not serious at the time the observations were made. Latham that year did not observe any particular difference at this nursery in the amount of blight on red and "white" cedars. Because of the interest in the juniper, J. ashei warrants further careful study and observation to determine any resistance that it may show under conditions favoring heavy loss from blight among red cedar seedlings.

Literature Cited

1. Anonymous. Forest Planting Leaflet. Red cedar. U. S. Dept. Agr. Forest Service Cir. 73. 1907.
2. Davis, W. C., and D. H. Latham. Phomopsis blight in some forest tree nurseries. Plant Disease Reporter 22: 24. Jan. 15, 1938.
3. _____, _____. Cedar blight on wildling and forest tree nursery stock. Phytopath. 29: 991-992. 1939.
4. _____, G. Y. Young, D. H. Latham, and Carl Hartley. Diseases of conifers in forest nurseries. U. S. Dept. Agr. Bur. Pl. Ind. Mimeograph pp. 17-18. 1938.

5. Hahn, Glenn G. Phomopsis juniperovora, a new species causing blight of nursery cedars. Phytopath. 10: 249-253. 1920.
6. _____. Phomopsis juniperovora and closely related strains on conifers. Phytopath. 16: 899-914. 1926.
7. _____. Cedar blight. Plant Disease Reporter Suppl. 75: 65-66. 1930.
8. _____, Carl Hartley, and R. G. Pierce. A nursery blight of cedars. Jour. Agr. Res. 10: 533-540. 1917.
9. Hartley, Carl. The blights of coniferous nursery stock. U. S. Dept. Agr. Bul. 44. 1913.
10. Stewart, F. C. The Phoma blight of red cedar. Phytopath. 8: 33-34. 1918.
11. White, R. P. Juniper blight. New Jersey Agr. Expt. Sta. Ann. Rpt. 50 (1928-1929): 270-272. 1929.

(Division of Forest Pathology, Bureau of Plant Industry, cooperating with The Osborn Botanical Laboratory, Yale University, New Haven, Connecticut).

REPORTS OF CEDAR BLIGHT IN 1939

Glenn Gardner Hahn

During 1939 reports of cedar blight (Phomopsis juniperovora Hahn) were received from a number of sources. It was reported by G. Y. Young, Bureau of Plant Industry, Civilian Conservation Corps, from southeastern Minnesota (Winona), where approximately 20 percent of a stand of 300,000 red cedar (Juniperus virginiana) seedlings were found infected. Considerable concern was felt over the disease at Winona, for the production of red cedar there is large. Production of one of the government tree planting agencies was shifted to Minnesota from Iowa because of the destructiveness of the disease in the latter State.

The blight also appeared in several nurseries in southern and southeastern Wisconsin. In one nursery in the southeastern part of the State the writer is informed that during July heavy loss was experienced among seedlings of Juniperus virginiana being grown for grafting purposes. Specimens of the disease were submitted by E. L. Chambers, State Entomologist, A. J. Riker, Department of Plant Pathology, University of Wisconsin, and C. A. Richards, Division of Forest Pathology at Madison, for diagnosis and determination. Isolations of the parasite made from this material by the writer produced culture characters typical of those described for Phomopsis juniperovora. It is interesting here to note that, although cedar blight was present and reported very destructive at a much earlier period (1895 to 1917) in southern Minnesota, Iowa, and northeastern Illinois, this report, so far as known, is the first of it as an epidemic nursery disease in Wisconsin. In a recent written communication from Dr. Riker (January 5, 1940), the writer was informed that in a Wisconsin nursery where cedar blight appeared serious this year, red cedar stock was originally obtained from the Illinois infection area.

Diseased nursery stock of Pfitzer juniper (Juniperus chinensis var. pfitzeriana) received from Pennsylvania (Doylestown) 1939, was found by the writer to be infected with Phomopsis juniperovora. Isolations of the parasite likewise produced the typical culture characters of the organism.

According to reports received from W. C. Davis and D. H. Latham, Bureau of Plant Industry, Civilian Conservation Corps, cedar blight did not appear as severe in Kentucky and Indiana in 1939 as in 1938. They reported the disease as particularly troublesome in Tennessee nurseries during the late summer and fall of 1939 and also in 2 North Carolina nurseries.

Damage from cedar blight has been negligible during the past few years, according to a written communication from E. Wright, Division of Forest Pathology, Lincoln, Nebraska, in the western section of the United States, in the Central States of Nebraska and Kansas, and in the Southern States of Oklahoma and Texas. There has been some cedar blight in the former, but it has not been definitely identified in any of the government nurseries in Oklahoma and Texas. Moreover, Wright did not find the disease in North or South Dakota, although there are reports of it in nurseries at Towner and Denbigh, North Dakota, that have not been verified. The recent negligibility of the disease in Nebraska and Kansas, where in the past cedar blight has been most destructive, may be due perhaps to the succession of drouth years in these States.

Division of Forest Pathology, Bureau of Plant Industry, cooperating with The Osborn Botanical Laboratory, Yale University, New Haven, Connecticut)

PHOMOPSIS GARDENIAE IN RELATION TO GARDENIA CULTURE 1/

Malcolm A. McKenzie, Linus H. Jones, and Constantine J. Gilgut

A fungus disease of gardenias encountered in connection with the commercial growing of plants in greenhouses in Massachusetts has been the subject of observations and experiments by the writers. The various recommendations previously published for the control of the gardenia canker caused by Phomopsis gardeniae do not afford the grower a completely satisfactory solution for the problem. In this connection there are certain factors which deserve further consideration.

Review of Literature

The first report of Phomopsis gardeniae as the cause of a canker and gall of gardenia was published by Hansen and Scott (7). As stated by Buddin and Wakefield (1), M. C. Cooke (3) referred to "Gardenia Canker" in England and indicated that it was "always extremely difficult to trace the cause of canker." Since he found only one spore type, Cooke called the organism a

1/ Contribution Number 363 of the Massachusetts Agricultural Experiment Station.

Phoma and considered that the fungus occurred "subsequent and not antecedent to" the canker. The gardenia canker illustrated in "Fungoid pests of cultivated plants" by Cooke (4) leaves little doubt that he was dealing with the same disease in England which is now reported widely in America. A comparison of the full description of the American fungus by Hanson and Barrett (6) with the fungus for which Buddin and Wakefield (1,2) reported A (1937) and B (1938) pycnidiospores from stem cankers of gardenias in England further suggests that the organisms concerned are apparently identical.

Tilford (11,12) reported a "Stem canker disease of Gardenia" in Ohio on plants of the variety Millosys purchased from a grower in the East. Obee (9) described the susceptibility of 3 varieties of gardenias to the disease as follows: californica, most susceptible, Belmont next, and veitchii, least susceptible. He indicated that in his experience, with but one exception at a node in the stem 4 inches above the ground, all cankers occurred at crowns. He recommended painting stems of healthy plants with Semesan. Pirone (10) indicated the need for a wound dressing. Goss (5) reported that 100 percent of the plants of the Belmont variety received at Nebraska in a shipment from Massachusetts was infected with a species of Phomopsis. Huber (8) and White (13) listed recommendations to aid growers in preventing the disease from becoming established in their plantings. Both reports advise, among other things, the removal and burning of plants as soon as they are known to be afflicted with the disease, and Huber further advises the discard or sterilization of soil surrounding diseased plants before it is used for replanting.

Observations

The examination of diseased plants from a greenhouse in which it was reported that many plants suffered similarly proved to be of considerable interest. There were no lateral shoots coming from the vicinity of the soil line. This was unusual as the cutting is potted ordinarily at sufficient depth so that a node is under the soil line. In the plants inspected no new growth had generated from the buried node. Examination of these unproductive nodes showed that mechanical injury inflicted by tearing a leaf or shoot from the node had removed the soft woody tissue of the gardenia trunks. It was noted also that a mechanical injury could frequently be found associated with a canker at the crown. Where mechanical injury could not be observed, it is possible that the ravages of the disease had destroyed the evidence of such injury. In some cases a broken shoot would still be clinging to the trunk, while in other cases all that remained was the short "snag" of the branch; and, in extreme cases, only the knot with evidence of a V-shaped tear below it. A canker was sometimes found on branches a foot or more above the ground. Such cankers were quite local and frequently occurred at a fork of a branch. This type of canker commonly was found associated with a drip in the greenhouse.

Experiments

The fungus, Phomopsis gardeniae, was present in tissue plantings from cankers of the crown and other parts of the diseased plants and the writers found, in accordance with previous reports, that gardenias inoculated through injuries in leaves, stems, and roots developed typical disease symptoms including leaf-spots, cankers and galls at the points of inoculation. Infections in smaller green stems did not spread extensively but tended to be limited to a flattened canker which rarely girdled the stem completely and only occasionally caused the twig to die back to the point of inoculation. Infections at the ground line or in the roots, however, proved to be particularly destructive to plants and resulted in girdling of main stems by both galls and cankers. Plants 1 or 2 years old were killed readily. Older plants showed an unhealthy color. They lacked a glossy green and had many yellow leaves. They wilted on bright sunny days and made little growth. Branches adjacent to the canker showed loss of vigor earlier than branches on the unaffected side of the trunk. The canker developed vertically, but as the soil became cool there was a strong tendency to girdle the trunk. Plants of unhealthy color often improved somewhat as the soil warmed up in the late spring and survived in the warmer soil of the summer growth period. Such recovery lasted until the soil again became cool.

As yet, the writers have found no instances in these experiments in which infection followed the inoculation of uninjured plants. Evidence that the fungus is localized in the region of malformation or distortion is to be found in the fact that to a considerable extent cuttings from diseased plants are free from the disease. Additional experiments will be undertaken in the hope of learning more about the specific conditions under which infections take place.

Discussion

Plants completely girdled by a canker are doomed to an early death. If replacements are available, the grower should use his judgment in regard to the possibilities of immediate financial return from the sick plant as compared with the new plant. Thus a sick plant may produce a few flowers in early winter when the return per bloom is high, while blooms from the replacement might be so delayed that they would not be available until the price received was very low. It is not an uncommon situation that the range in price received may be such that it would take 20 flowers from the replacement plant to equal the price that would have been received for 1 flower taken in early winter from the original plant. It is, therefore, important to keep in mind the fact that the commercial producer of flowers is primarily interested in blooms and not in plants. Hence, at a given time, it might well happen that a sick plant would be of considerable commercial value if its buds opened when prices were high; while the eradication of all diseased plants immediately, according to conventional recommendations, would bankrupt some commercial growers.

Moreover, a strict sanitation program would decree the sterilization of soil surrounding roots of diseased plants before replanting. Yet, when this was not done, there was no appreciable number of cases where new unwounded plants were infected from the soil. Likewise, no evidence was apparent that the disease was spread from an infected plant to an unwounded healthy plant by watering and syringing.

Some cankers are conspicuous, rough, and soggy, while others are rather obscure and quite smooth. The smoothness may be due to the activity of sow bugs which have used the soft, decomposing bark as food. The authors do no more than suggest that sow bugs, and possibly other agents, feeding on cankers could collect spores on their bodies and distribute them to uninfected plants having mechanical injuries or other non-parasitic defects. While a defect in a plant free from parasitic organisms could possibly be healed by the development of callus tissue, the invasion of host tissue by the causal fungus might depress callus formation, especially when the temperature is relatively low and when the plant is less vigorous.

Conclusions

In planning for his future crop of plants, a grower may well give meticulous care to the selection and handling of cuttings. Proper care in using a sharp knife to avoid tearing of plant tissue is of considerable aid in making the right start for the new plants. If possible, new plants should be segregated from plants known to be infected. Concerning the growers' current crop, a panic-free recommendation must not overlook the importance of blossoms when the market price is high even if the plants bearing blossoms are known to be diseased. Therefore, if due care is exercised in handling diseased plants, and appropriate methods are adopted for the control of any suspected vectors of the causal fungus, the writers conclude that the grower need not sacrifice infected blossoming plants immediately if their bloom value warrants delaying their uprooting and burning until the end of their blossoming period.

Literature Cited

1. Buddin, W., and E. M. Wakefield. A stem canker disease of gardenias. Gard. Chron. 101: 226-227. 1937.
2. _____, _____. Stem canker of gardenias. Gard. Chron. 103: 45. 1938.
3. Cooke, M. C. Answers to correspondents. Gard. Chron. 15: 605. 1894.
4. _____. Fungoid pests of cultivated plants. p. 165. 1906.
5. Goss, R. W. Phomopsis canker of gardenia in Nebraska. U.S.D.A. Plant Dis. Rep. 20: 128. 1936.
6. Hanson, H. N., and J. T. Barrett. Gardenia canker. Mycologia 30: 15-18. 1938.
7. _____, and C. E. Scott. A canker and gall disease of gardenia. Science (n.s.) 79: 18. 1934.

8. Huber, Glen A. A phomopsis canker and gall disease of gardenia. Florists' Exch. 86 (10): 11. 1936.
9. Obee, D. J. A note on the canker disease of gardenias. Trans. Kansas Acad. Sci. 39: 103-104. 1936.
10. Pirone, P. P. Where are gardenia cankers initiated? Phytopath. 28: 597-598. 1938.
11. Tilford, Paul E. Stem canker disease of gardenia. Ohio Agr. Expt. Sta. Bimo. Bul. 19: 116-117. 1934.
12. _____. Stem canker disease of gardenia. Canad. Florist 29: 232. 1934.
13. White, Harold E. Careful culture recommended to avoid canker on gardenia. Florists' Rev. 79 (2048): 9-10. 1937.

(Massachusetts Agricultural Experiment Station).

VERTICILLIUM WILT OF LAURESTINUS

J. A. Milbrath

Verticillium wilt has been observed in a planting of 350 Laurestinus shrubs, Viburnum tinus Linn., in a nursery near Portland, Oregon, since November 1938. The plants were growing poorly, the leaves were small, the branches were dwarfed, and parts of several were dead. Only 30 of the 350 shrubs appeared normal in size and growth. The vascular areas of the roots and stems were discolored, showing a yellow or light brown color. Pure cultures of Verticillium were obtained from pieces of this discolored tissue, and the same fungus was again isolated from another lot of plants from this nursery in February, 1939. Three Laurestinus shrubs were inoculated with pure cultures of the Verticillium, and after 6 months 2 of the inoculated plants exhibited the symptoms noted in the nursery. The fungus was recovered from the inoculated plants.

The fungus is similar to Verticillium albo-atrum Reinke and Berthold. The verticillate conidiophores and conidia are produced on potato dextrose agar in 2 to 3 days. The colony may become cottony in structure, or may remain flat with the formation of numerous sclerotia. Sclerotia form when the fungus is transferred to autoclaved sweet clover stems. Cross inoculations are in progress to determine the specificity of this Verticillium.

(Oregon State College).

GRANVILLE WILT OF TOBACCO IN MARYLAND

E. A. Walker

During the late summer Granville wilt (Bacterium solanacearum) [Phytomonas solanacearum] was observed by the Local County Agent, Mr. M. G. Bailey, on a farm in Prince Georges County, Maryland. Visits to this field by the tobacco specialists of the University of Maryland and the U. S. Department of Agriculture on about August 2 confirmed this disease to be Granville wilt. This field of about 1-1/2 acres was planted to tobacco in 1936, at which time there was no evidence of disease. It was again planted to tobacco in 1937, when the disease was observed in exactly the same area as it occurred in 1939. The field was not planted to tobacco in 1938. About 1/4 acre was completely destroyed in the 1939 crop. Isolations of the causal organism, B. solanacearum, were made by Doctor Foster at the Arlington Farm, U. S. Department of Agriculture, from material collected by Dr. E. E. Clayton on August 2, and plants inoculated with the bacterial cultures secured developed typical symptoms of Granville wilt in the U. S. Department of Agriculture tobacco greenhouse. Diseased material was sent to Dr. T. E. Smith, of Oxford, North Carolina, who is specialist on the Granville wilt disease in that State. The organism isolated by Doctor Smith from the Maryland specimens gave a typical reaction for B. solanacearum. On August 8 the writer visited Doctor Smith during the 5th Annual Tobacco Disease Council Conference at Greenville, Tennessee, at which time the identity of the organism had been determined. Isolations have been made from diseased plants by the writer, and the organism gives typical reactions for Granville wilt. Soil from the farm affected with Granville wilt has been placed in the greenhouse during the winter, and from a crop of Maryland tobacco grown therein several plants show typical symptoms of Granville wilt. Further studies will be continued on this disease.

(University of Maryland Extension Service).

CONTROL OF LEAFSPOT OF PEANUTS IN VIRGINIA - 1939

Lawrence I. Miller

Studies initiated in the spring of 1938 were continued during 1939 at the Holland Sub-station, Holland, Virginia, in an effort to evaluate the relative damage caused by leafspot, and also to determine the effectiveness of different sulphur dust application schedules in the control of Cercospora leafspot.

Eight field experiments were conducted in 6 of the leading peanut-producing counties of the State. Each field experimental plot lay-out was similarly arranged as a part of a farmer's peanut acreage with 126 plot tests of 1/120 acre each, 45 of which were used as checks. On the remaining 81 plots the following sulphur dusting schedules, on a 2-week application basis, were tested as to their relative effectiveness in controlling Cercospora leafspot:

Schedule

A - - 5	applications	starting	July	1
B - - 5	"	"	"	15
C - - 4	"	"	"	1
D - - 4	"	"	"	15
E - - 4	"	"	Aug.	1
F - - 3	"	"	July	1
G - - 3	"	"	"	15
H - - 3	"	"	Aug.	1
I - - 3	"	"	"	15

On September 1, about a month and a half before the peanuts were dug at each experimental lay-out, the ratio of spots per central stem leaflet was higher than at any other time during the season. An average of 86 percent of the leaflets on the central stem of the plants in the untreated plots had at least one Cercospora necrotic lesion. The most effective schedule applications, A, B, C, and D, averaged 43 percent of the leaflets on the central stem with spots. D and G applications which started July 15 averaged 55 percent of the leaflets on the central stem with spots, E and H applications starting August 1 60 percent with spots, and I treatment starting as late as August 15 only held the percentage of leaflets on the central stem down to 73 percent, or 13 percent less than the checks.

In every experimental lay-out the yield in pounds per acre from the sulphur-dusted plots was greater than that from the untreated peanuts located outside the area in which the experiment was conducted, with the average increase amounting to approximately $18.00 net profit per acre.

(Virginia Agricultural Experiment Station, Holland Sub-station, Holland, Virginia).

NEMATODE INJURY TO POTATOES IN CALIFORNIA

John T. Middleton

Potatoes harvested from a 40-acre field at Nuevo, California were severely infested with nematodes, [presumably Heterodera marioni]. About 40 percent of the crop was lost on this acre alone. In an adjoining field of 10 acres, there was very little nematode infestation, less than 1 percent. Neither field had ever produced potatoes prior to this time. The 40-acre block had been in peaches the year before. The peaches had been cut down and pulled out and the ground fallowed prior to planting the potato crop. The peaches were affected with nematodes. The 10-acre block had been under cultivation for about 8 years, having produced only grain crops.

A 20-acre field of potatoes that yielded only 80 sacks (100 lbs.) (av. 150/acre) to the acre was severely infested with nematodes, about 80-90 percent. This same block has been in potatoes for the past 3 years. Each year the infestation has become progressively worse. If proper cultural practices had been employed the excessive losses could have been appreciably reduced.

In general it may be said that nematode infestation of potatoes is more pronounced and causes greater damage to the fall crop (July-September).

(California Agricultural Experiment Station).

BROWN PATCH ON ST. AUGUSTINE GRASS

A. A. Dunlap and Walter N. Ezekiel

Lawns of St. Augustine grass (Stenotaphrum secundatum (Walt.) Kuntze) in the Gulf Coast section of Texas, particularly around the city of Houston, have been attacked during the past several years by what seems to be typical brown patch. According to reports, the diseased areas appear in the late fall and continue to spread until March or April. Overwatering has been noted to increase the rapidity of spread. With the beginning of hot, dry weather in the late spring the grass recovers quickly.

The general aspects of the brown spots are similar to those of this disease on other grasses, except that due to the intermingling of many stolons in St. Augustine turf, the margins of the spots are less distinct. Central portions of the diseased areas show browning or complete decay of the short nodal roots and browning of the leaf blades. The strong creeping stolons are apparently not attacked, which makes rapid recovery possible as soon as conditions become unfavorable for the fungus. Toward the edge of the spots, the upper surface of the turf appears normal, but the basal portions of the leaf blades are yellowed and water-soaked in appearance. Microscopic examination has disclosed mycelium of Rhizoctonia on the rootlets and permeating the yellowed leaf blades. Cultures from such leaves have always yielded Rhizoctonia. These observations suggest that the fungus may spread superficially in the dense turf and attack first these basal portions of the blades. The various fungicidal treatments, already worked out for brown patch, have been recommended for use in the Houston area.

(Texas Agricultural Experiment Station).

PROLONGED JANUARY COLD CAUSES HEAVY DAMAGE IN THE SOUTH

JANUARY WEATHER:

Following, and in contrast to, an abnormally warm December in practically all parts of the country, January was extremely cold throughout the central and southern States east of the Rocky Mountains. It was the coldest January of record in large areas. In Central, Southern, and Eastern States the outstanding abnormal temperature characteristic was the persistence of the cold weather, with but little variation from day to day, rather than extremely low individual temperature readings. The remarkably long, cold period began with the last few days of December and continued almost uninterruptedly through January, except for a moderate respite during the week ending January 15.

Figure 1 shows that the monthly mean temperatures ranged from about 10° to as many as 18° below normal everywhere from the middle Atlantic area, the Ohio Valley, the north-central Mississippi Valley, and the north-central Great Plains southward to the Gulf. Most first-order stations from southern Virginia, the Ohio River, and the lower Missouri Valley southward had the lowest mean January temperature of record. In parts of the Southeast the monthly means were about 5° lower than for any previous January.

The temperature for January, 1940, was in marked contrast to that for the general run of Januarys during the preceding 2 decades. For example, for the past 20 years, New York had only 6 below normal; Washington, 5; Chicago, 6; Kansas City, 5; Memphis, 6; and Atlanta, 2.

On the other hand, the States west of the Rocky Mountains had an abnormally warm month, the plus departures from normal temperature ranging generally from 3° to as many as 6°. Also, in the upper Lake region and extreme central-northern sections of the country about-normal warmth prevailed.

Figure 2 shows that precipitation was very unevenly distributed geographically. The amounts were abnormally heavy in the Rocky Mountain area, in much of California, and in a limited southeastern section of the country. Also, part of the central Great Plains, particularly much of Kansas, had above normal for the month.

In other sections precipitation was deficient, markedly so in Central-Northern States and a considerable southwestern area. Snowfall was unusually heavy from the Potomac Valley southward, and it was much above normal in a considerable area of the central Great Plains. (U. S. Weather Bureau, Weekly Weather and Crop Bulletin for week ending February 6).

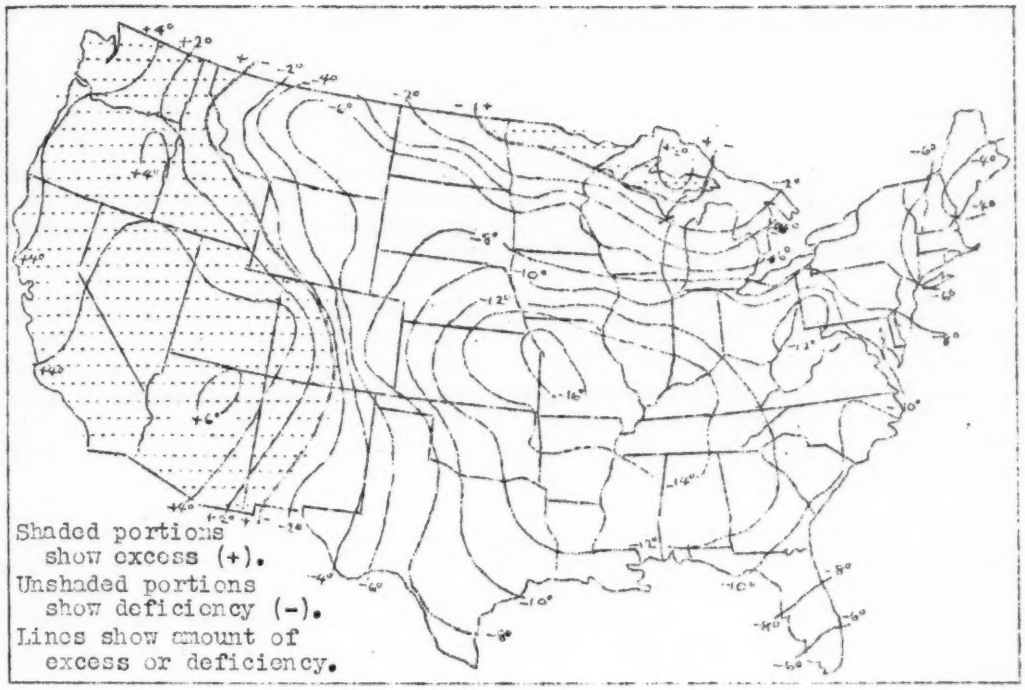

Fig. 1. Departure of mean temperature from normal for January 1940.

Fig. 2. Percentage of normal precipitation for January 1940.

HEAVY FREEZE DAMAGE IN THE SOUTH:

A prolonged period of abnormally cold weather occurred throughout the region east of the Rockies during the last 2 weeks of January. Freezing weather covered the entire southern part of the country and heavy damage resulted in southern winter-farming areas. The extent of loss from freezing is indicated in accounts from consecutive numbers of the Weekly Weather and Crop Bulletin, and the maps (Figures 3 and 4) show the amounts of the temperature departures for both weeks.

Heavy Freeze Damage in Much of South: Reports from the field indicate that, because of the long-continued, abnormally cold weather, heavy damage has resulted to winter crops in much of the South. In fact, it has been one of the most severe periods of sustained low temperatures in many years. Naturally, complete appraisal of the extent of damage is not possible at this time, but the following summary indicates broadly the probable result of the low temperatures:

In Atlantic coast sections north of South Carolina there has apparently been no noteworthy damage to winter truck, although temperatures were too low for growth. In South Carolina there was a hard freeze to the coast, with very likely some damage, at present undetermined, but apparently not serious. In Georgia more or less harm is indicated, probably not extensive.

In Florida there was a hard freeze in northern sections and killing frost extended over the interior to the Okeechobee muck lands. Considerable damage is indicated to tender truck, but not serious to hardy crops. Citrus groves required protection in the central and northern parts of the producing area, with some freeze damage indicated in unprotected groves. Killing frost did not extend to the more southern portions of the State, but truck there was retarded by low temperatures. In Alabama both truck crops and satsumas in the extreme south appear to have been severely affected. Also, damage appears heavy in Mississippi where replanting of tomatoes will be necessary; cabbage appears to be generally ruined.

In Louisiana a sustained, hard freeze extended to the coast which killed all tender vegetation and severely damaged hardy truck. In Texas extensive harm is indicated to truck and gardens, with total loss apparent in many localities and citrus damaged considerably in the lower Rio Grande Valley; the cabbage crop is probably largely lost. In Pacific sections there was some frost damage to vegetation in the Imperial Valley of California and light firing was required in some citrus areas; damage was not extensive. (Week ending January 23).

Extremely Heavy Freeze Damage in South: The outstanding feature by far of the week's weather was the abnormally low temperatures, the lowest in many years, throughout southern winter-farming sections, with freeze damage exceedingly heavy, disastrously so in Florida. The following summary is a tentative appraisal of the results of the freeze, as well as can be determined at present:

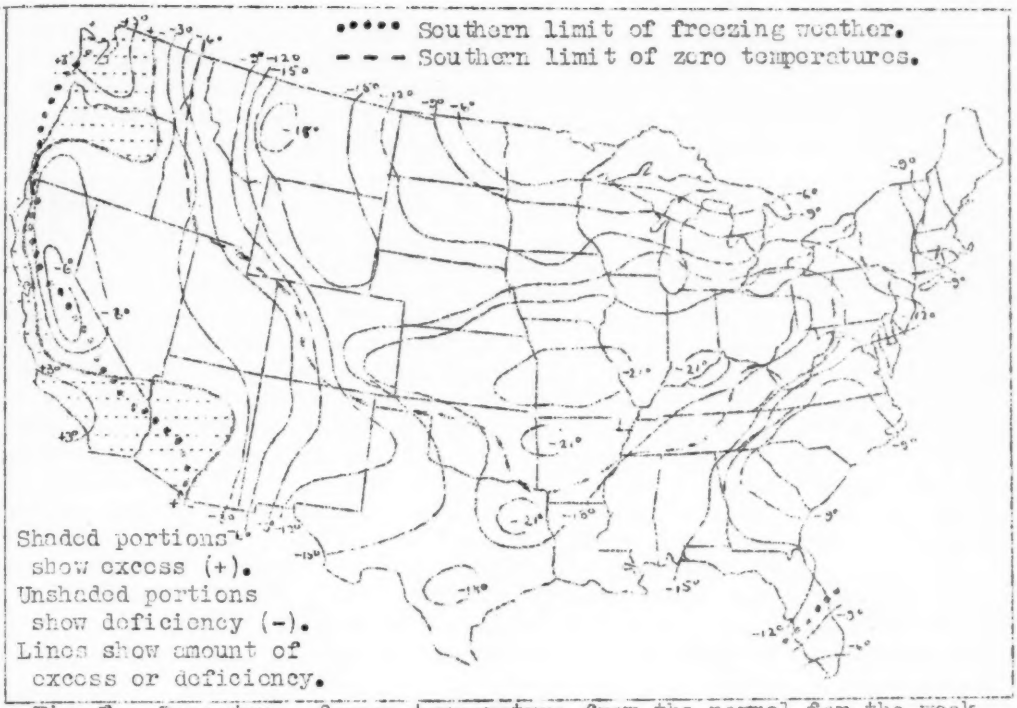
••••• Southern limit of freezing weather.
- - - Southern limit of zero temperatures.
Shaded portions show excess (+).
Unshaded portions show deficiency (-).
Lines show amount of excess or deficiency.

Fig. 3. Departure of mean temperature from the normal for the week ending January 23, 1940.

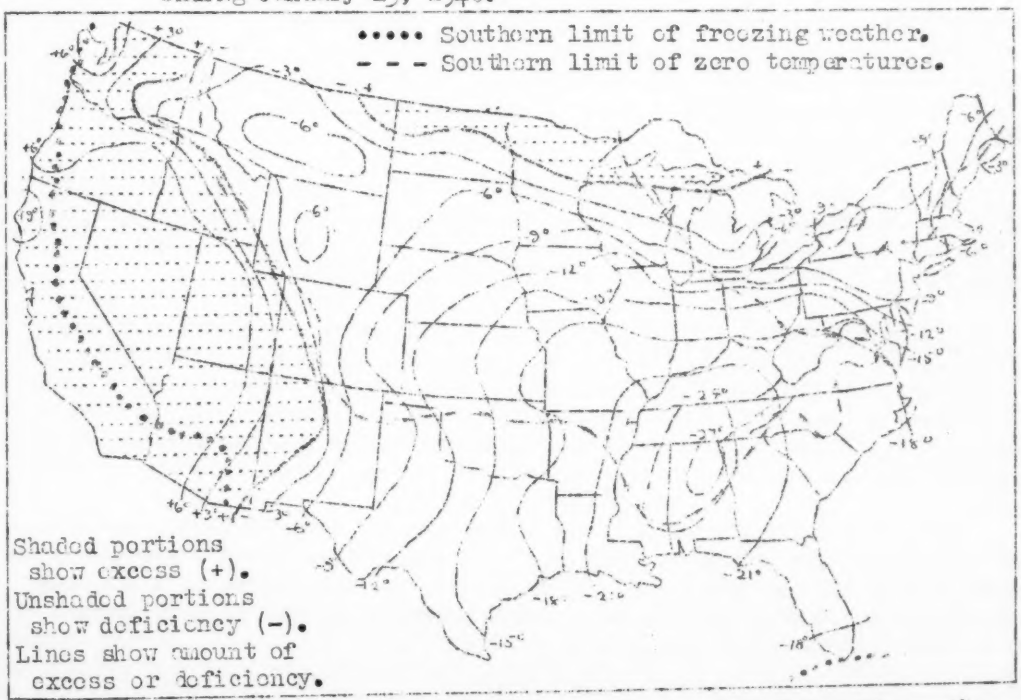
••••• Southern limit of freezing weather.
- - - Southern limit of zero temperatures.
Shaded portions show excess (+).
Unshaded portions show deficiency (-).
Lines show amount of excess or deficiency.

Fig. 4. Departure of mean temperature from the normal for the week ending January 30, 1940.

In the Carolinas and Virginia there was no extensive harm, principally because of the limited amount of crops susceptible to damage. In southeastern Virginia mature spinach was not damaged materially, while in South Carolina but little coastal truck had been planted. In southern Georgia damage was heavy to truck and some other field crops.

Florida had the most severe freeze in 25 years, with temperatures ranging from 15° to 22° in citrus areas, and 18° to 27° in winter trucking districts Sunday and Monday mornings. They were below 25° from 10 to 15 hours in citrus districts of the north and central portions. Truck was nearly totally destroyed in all sections, with an estimated damage of nearly $13,000,000 in Dade County alone, though forced harvest by the previous freeze salvaged many cars of cabbage and lettuce. Sugar cane was frozen, but much can be salvaged. Unharvested oranges, more than half the total crop, tangerines, and grapefruit are nearly a total loss; forced harvest salvaged hundreds of cars of choice fruit, but losses will run into millions of dollars. Citrus trees had been drought-shocked last April and were in semi-dormant condition, with no tender growth, and they probably weathered the freeze with comparatively little wood damage, although severe defoliation is expected. The extent of tree damage can not yet be determined, but they were in the best possible shape to withstand the cold. Ferns are nearly a total loss, some $2,000,000, with a rough estimate of total truck damage of more than $25,000,000. Tungs were dormant and believed unharmed. Potatoes in the Hastings district were not up and are apparently safe.

In the coastal areas of Alabama, truck crops were killed and satsumas were damaged severely, but to an unknown extent, while in Mississippi heavy damage occurred to exposed truck crops. Louisiana experienced the longest period of severely cold weather on record for the State. Nearly all hardy truck was killed; damage to cane, citrus trees, oats, and cover crops is as yet unknown.

The truck crops of Texas are nearly a total loss, with only small amounts of hardy truck expected to revive. Cabbage was severely damaged and there was considerable harm to citrus fruit, but groves in the valley were apparently not killed. (Week ending January 30).

Replanting Truck in Southeast: With warmer weather, considerable activity is reported in the Southeast, especially in parts of Florida, in replanting truck that was killed by the severe freeze of last week. However, except in southern Florida, but little of this work could be done until near the close of the week, as abnormally cold weather continued until that time.

Late reports indicate that some hardy truck escaped in the coastal areas of central and southern Florida, although citrus fruit shipments have ceased pending the determination of frost damage. In Georgia all growing crops sustained severe damage, with truck practically all killed, except in some extreme southeastern and southern counties.

In central Gulf areas loss was heavy, but there are still conflicting estimates as to the actual amount of damage. In Louisiana late reports indicate that it was somewhat less than at first thought. In Texas only hardy truck survived the freeze, the tender varieties being all killed, with cabbage seriously injured, but not as severely as at first thought. In that State the follow-up rains and warmer weather were helpful in reviving crops that had been damaged or stunted.

In Oklahoma the freeze damaged oats heavily, but the extent of harm to wheat is still uncertain. In Texas there was some damage to wheat, but apparently only a small amount was killed outright. Early planted oats and other grains are showing some revival with higher temperatures and precipitation, but the late planted just coming up was badly damaged or mostly killed. (Week ending February 6).